parasites will only have searched one-fiftieth of a cubic millimetre. Now, since this volume is only about 1/150,000,000 of the blood in a man's body, it follows that there is a considerable chance that not a single parasite might be detected, although the individual might have 150 million of them in his circulation at the time!

Major Ross's preference for the determination of the "spleen-rate" appears justifiable on grounds of expediency, but, although he points out most of the more obvious fallacies to be guarded against in making such estimations, he scarcely appears to attach sufficient importance to these. For instance, there is very little experience accumulated as to the length of time which some degree of splenic enlargement may persist after recovery, while the splenic enlargement caused by ankylostomiasis, as has recently been pointed out by Darling, would invalidate the tests in certain localities.

The section dealing with the laws which regulate the number of anophelines in a locality will be fascinating reading to all who have some practical knowledge of these pests, and is full of most suggestive matter, much of which will doubtless be put to the test by those who have opportunity. The problem of attempting the destruction or limitation of mosquito life, under conditions where extensive breeding places abound, and where the usual measures appear at first sight impracticable, are boldly faced, and those who are satisfied with Major Ross's mathematical demonstrations on such points as the variations of mosquito density due to various causes, the random scatter of mosquitoes from a given point, &c., will find it necessary to revise some views which have been and are extensively held on the impossibility of limiting the mosquito population in certain conditions.

The thoroughness with which the earlier portions of the book have dealt with all branches of the subject greatly adds to the value of the chapter dealing with the selection of the preventive measures to be made in a given instance, since one is able to follow the author in his clear exposition of the manner in which one must study the local conditions in every instance before deciding on the plan of campaign. As he is careful to point out, without such close study of these conditions a scheme might be drawn up which was foredoomed to failure, and large sums of money might uselessly be thrown away. The chapter abounds in valuable practical hints for the guidance of those responsible for the organisation of such campaigns, and it may also be studied with the greatest profit by laymen whose only desire is to know how best they, individually, may avoid infection on proceeding to a malarious country.

The second half of the book consists of a series of articles by well-known authorities dealing with experiences of individual malarial campaigns in many countries, and these afford a number of object-lessons in the application of the principles enunciated in the first half. There are altogether twenty-one contributors to this portion, and the majority are recognised authorities on the subject of malaria in the particular country dealt with. For instance, the campaign against malaria in Italy is from the pen of Prof. Celli, while that dealing with the most successful of all malarial campaigns, that in the Isthmus of Panama, has been written by Colonel Gorgas. Dr. Schilling deals with malaria in German possessions; and the measures employed in French territory are described by Dr. Edmond Sergent. The completeness of this portion of the book is indicated by the fact that it concludes with two most interesting articles on the prevention of malaria in troops in war and in peace, the former by Lieut.-Colonel C. H. Melville, and the latter by Major C. E. P. Fowler, who was associated with Major Ross in his campaign in Mauritius, to which so many allusions are made in the systematic portion.

Major Ross and his collaborators may be congratulated on having produced a work which will be of the highest value to all who are concerned with the future progress and welfare of our tropical possessions.

W. B. L.

## *THE BRITISH MUSEUM COLLECTION OF FOSSIL REPTILES.*

(1) *A Descriptive Catalogue of the Marine Reptiles of the Oxford Clay, based on the Leeds Collection in the British Museum (Natural History), London.* Part i. By Dr. C. W. Andrews, F.R.S. Pp. xxiii+205+x plates. (London: Printed by order of the Trustees of the British Museum, 1910. Sold by Longmans and Co., B. Quaritch, and Dulau and Co., Ltd.) Price 25*s*.

(2) *A Guide to the Fossil Reptiles, Amphibians, and Fishes in the Department of Geology and Palaeontology in the British Museum (Natural History).* Ninth edition. Pp. xviii+110. (London: Printed by order of the Trustees of the British Museum, 1910.) Price 9*d*.

(1) THE museum having acquired the unrivalled collection of reptilian remains obtained with much labour and unceasing care by the Messrs. Leeds—more especially Mr. A. N. Leeds—from the brick-pits in the Oxford Clay near Peterborough, it was only fitting that they should be described in a manner worthy of their importance and value. So far as the marine forms are concerned, that is to say, the ichthyosaurs, plesiosaurs and pliosaurs, and crocodiles, the task has been entrusted to Dr. C. W. Andrews, who for several years past has devoted a large portion of his time to the study of these groups. How thoroughly well he has accomplished the work will be apparent to all specialists who study the present volume, which deals with the ichthyosaurs and plesiosaurs.

The work appeals, however, to other than specialists, for it not only serves to make known the remarkably fine state of preservation in which many of the skeletons of these strange reptiles are found, but it also contains a number of interesting observations with regard to their probable mode of life and the conditions in which they existed. So nearly complete, indeed, are many of the skeletons, that not only has it been found possible to mount several for public exhibi-

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tion, but, owing to the separation of their constituent elements, the details of the osteology can be studied, except in the case of the skull, which is often badly crushed, as if they belonged to modern reptiles. It should be added that this full acquaintance with the osteology of these saurians is largely due to the extreme care exercised by Mr. Leeds in extracting them from the matrix.

The remains are generally supposed to have been laid down in rather deep water, but the association of the marine forms with terrestrial dinosaurs, and perhaps also the occurrence of masses of lignite, suggests that the deposit was formed near a coast, and not improbably represents the mud-banks in the delta of a mighty river. Here Ophthalmosaurus, the single and most highly specialised representative of the ichthyosaurs, with its powerful caudal fin, pointed head, enormous eye, and porpoise-like body, probably lived in the open sea, where it played the part now assumed by whales and grampuses. Why this particular type should have become practically edentulous, whereas its upper Cretaceous successors were remarkable for their powerful dentition, is somewhat difficult to understand, although, as Dr. Andrews suggests, this feature was probably connected with the nature of its food. Certain features in its organisation suggest that it was capable of "sounding" to considerable depths.

In marked contrast to the movements of this ichthyosaur were those of the contemporary plesiosaurs, which were far more specialised types than their forerunners of the Lias. Instead of being driven through the water by the screw-like action of a powerful tail-fin, these appear to have rowed themselves on or near the surface by means of their strong paddles, of which the hind pair was nearly equal in capacity to those in front, whereas the tail was short, and provided, at most, with a rudimentary fin. Their whole organisation indicates that they haunted the neighbourhood of the coasts, whereas their short-necked and more strongly built relatives the pliosaurs may be assumed to have ventured further out to sea, although they did not possess the truly pelagic habits of the whale-like ophthalmosaur. The littoral habits of the plesiosaurs exposed them to much more varied conditions of life than was the case with the last-named reptile; and it was these diverse conditions which probably led to the differentiation of the group into the numerous types so well described in the volume before us.

To follow the author through his survey of the osteology of the groups forming the subject of this volume would demand much greater space than the editor is disposed to grant. Attention may, however, be directed to the figure on p. 12 illustrating the form and arrangement of the constituent bones of the occipital region of the ophthalmosaurian skull, and more especially to the remarkable position and relations of the opisthotic and stapes. The great length of the parasphenoid element (p. 15) is also noteworthy, while of even greater interest is the author's reference of the ichthyosaurian humerus to its proper side of the body (p. 52). Among the plesiosaurs it must suffice to refer to the determination of the relations and form of the clavicles and interclavicles, and especially the gradual waning of the latter (compare Figs. 61, 62, 70, 88).

Dr. Andrews has a good deal to say as to the phylogeny of the ichthyosaurs, for which readers must refer to the work itself; that of the plesiosaurs and pliosaurs is reserved for the second volume, which we hope to welcome before many months are past.

(2) Passing on to the guide-book to the fossil reptile and fish galleries, the mere fact that a new edition has become necessary after the lapse of only five years from the issue of its predecessor (which was entirely re-written), affords sufficient evidence that the work meets the requirements of the class of visitors for whom it is intended. As we are told in the preface, the new edition is practically a replica of the eighth issue, and therefore demands no special notice in this place. It may be noticed, however, that the price has been raised from sixpence to ninepence, at which figure the work is still a marvel of cheapness. In the next edition it might be well to explain the meaning of "type" specimens (*vide* preface), of which the general public has no conception, and likewise to amend the legend to Fig. 39, which states that the specimen belongs to a small tortoise, whereas it is really something like twenty inches in length.

R. L.

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## ELECTRO-CARDIOGRAMS.

*Das Elektrokardiogramm des gesunden and kranken Menschen.* By Prof. Friedrich Kraus and Prof. Georg Nicolai. Pp. xxii+322. (Leipzig: Veit and Co., 1910.) Price 12 marks.

THE electrical phenomena of the living heart has been a fascinating study among physiologists since the early days of electro physiology; information has been gathered with greater and greater accuracy as apparatus and methods of investigation became more and more refined, and now the registration of the electrical changes in the heart may be, and is, practically employed in the diagnosis of heart affections in the wards of the hospital. A full discussion of the origin and progress of method in this direction is given in this book, which has been produced by authors well acquainted practically with all the details of this branch of physiological and clinical inquiry. The progress of research is strikingly shown in a bibliography at the beginning of the work containing a list of 243 papers on the subject, of which no fewer than 131 have appeared since the beginning of 1900.

It is interesting to notice that investigations into the electrical phenomena of the heart are associated at different periods with the invention of special instruments and methods, such as the galvanometers of Matteucci and du Bois Reymond, the differential rheotome of Bernstein, the capillary electrometer of Lippmann, and, still more recently, the string galvanometer of Einthoven. Matteucci, in 1843, was the earliest observer with the galvanometer; then, in 1849, followed du Bois Reymond with his bussole; Köllker

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